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CHECK LIST OF AGARICS OF KAGHAN VALLEY-1

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Abstract

The list of Agarics of Kaghan valley includes 228 species belonging to 59 genera, placed in seven orders. Out of these, 24 species are edible. These were collected from Kaghan: Sharhan, Shogran, Naran and Lalazar ranging from 5000 feet to 9000 feet with thick forest cover. However, the forest become scanty in alpine region; at Babusar top (13684 feet) few *Boletus* species under *Juniper* bushes were reported.

Introduction

The Kaghan valley is one of the most beautiful places in Pakistan. It is subtropical contiguous to Hazara (Ahmad, 1969). It is situated between 34 30'to 35 15' latitude N and 73 18' to 74 5' longititude E. It extends over about 160 km rising from an elevation of 1,343 meters to its highest point, the Babusar Pass at 4150 meters (13684ft). This valley lies in the North of district Mansehra of Hazara Division, North West Frontier Province (N.W.F.P.). It is at its best in the summer months, with temperature between 3.3-12^{o}C from the middle of May up to the middle of October.

Champion *et al.*, 1965 divided Hazara division into three major zones. Later Anwar (1971) divided the whole Kaghan valley into four Ecological zones: 1) Subtropical pine zone: including Balakot, Kewai, Mahandari, Bhunja sharif. 2) Temperate zone (Trans Himalayan): including Sharhan, Shogran, Sari hut, Bella, Kaghan. 3) Subalpine (Trans Himalayan): including Naran, Saif ul Maluk, Lalazar, Batakundi, Burawai & Besal and 4) Alpine (TransHimalayan): including Lulusar lake, Gittidas, Babusar.

The Kaghan valley is drained by the River Kunhar originating from Lulusar Lake. The average rainfall for spring, summer and winter are 14.3, 25.8, and 7.5 inches respectively. The average snow fall received annually at Jared (5000 ft high) Kaghan: 662; Shogran: 7,749; Naran: 800 is 03, 08, 10 and 20 ft respectively. The reliable data for the other zones like sub alpine, alpine, and trans Himalayan are not available. This valley is at its best in the summer months from May to September.

Late Dr. Sultan Ahmad (1910-1983) being a pioneer, worked on the taxonomy of fungi of Pakistan and published over 170 research papers including monographs. In 1980 he published an account of order Agaricales of Pakistan containing 61 genera. He also recorded many agarics in his publications entitled Contributions to the fungi of Pakistan (1956, 1969). Khan (1975) studied wild and exotic mushrooms in Pakistan and reported 91 different mushrooms from different parts of the country. Mirza & Qureshi (1978) compiled all the published material in "The fungi of Pakistan". Jamal (1982) studied the common *Boletus* and *Amanita* of Pakistan. Sultana *et al*., (1996) worked on edible mushrooms. The japanese scientists during the Cryptogamic Expedition of Northern areas recorded many higher fungi alongwith micro fungi. Shibata (1992), Murakami (1993) also worked on fungi. The Fungi of Pakistan have been compiled by late Sultan Ahmad, Iqbal & Khalid, 1997. In addition to the above described literature the following books were also consulted for the identification: Marcel, (1987), Pegler, (1977), Smith, (1973), Svrcek (1983). These studies show that the agaric flora of Pakistan is extremely rich. The described species seem to be a fraction of the fungal flora, which remain to be discovered.

Materials and Methods

The cited species were collected by the senior author herself and Muddassar Fida, Field Assistant. These were dried in the sun and identified by comparing the field data and microscopic characters with the existing literature. The mushrooms were deposited in the mycological herbarium of Pakistan Museum of Natural History (PMNH), H-7, Shakarparian, Islamabad. Species recorded for the first time from Pakistan are indicated by an asterisks (*).

Results and Discussions

Order **Boletales**

Fruiting body fleshy, with pores and tubes

Family: **Bolitaceae** Singer

Hymenium tubular. Pores simple/compound, minute, broad or hexagonal, some times radial, elongated or nearly gill-like, spores mostly fusiform or elongated.

Subfamily: **Bolitoideae**

Cap thick and dome shaped. Pores small to medium, cap surface glabrous to greasy, neither distinctly velvety nor truly viscid. Clamps absent and trama divergent.

Genus: ***Boletus*** Dill. ex Fr.

Fruiting body thick, cap hemispherical with stout stipe, often reticulate surface, swollen in the middle or spindle-shaped. Spores smooth or only very obscurely ornamented.

Boletus edulis Bull., Edible

Cap 12-25 cm, fleshy, surface greasy, dark-brown, with slightly russet tint, margin persistently white. Pores surface changing to yellowish. Spores 15 x 5 µm. Under broad-leaved tree and conifers. It is known the best *Boletus* (delicious).

On soil, Shogran, Sharhan, 25.8.89, PMNH5776; Shibata (1992). Iqbal & Khalid (1996); Ahmad *et al*., (1997).

Boletus edulis f. ***appendiculatus*** Fr.

On ground, Kund, Nadi, Balakot, Iqbal & Khalid (1996).

Boletus erythropus Pers.

=*Boletus luridus* var. *erythropus* (Pers.) Fr.

On soil Sharhan, 24.8.89, PMNH 166; Shibata (1992): 146; Malakandi, Sharhan, Iqbal & Khalid (1996), Ahmad *et al*., (1997).

Boletus fraternus Peck,

In the forest of *Quercus* trees, Murakami, (1993): 125.

Boletus lupinus Fr.

On soil, Kamalban, 10.7.89, PMNH 5775.

Boletus pulverulentus Optawski
On ground, under *Abies pindrow*, Sharhan, Iqbal & Khalid (1996).

Boletus subvelutipes Peck.
On ground, in *Cedrus, Picea* and Pine forests, Shogran, Murakami (1993): 125 Ahmad *et al*., (1997).

Boletus ustalis Berk.
On the ground, Murree, Ahmad, (1980).

Genus: ***Tylopilus*** Karst.
Spores and pores pink and stipe with pink net.

Tylopilus prophyrosporus (Fr.) A.H. Smith
Taste none, odour none. On ground, Shogran, Murakami (1993), Iqbal & Khalid (1996).

Genus: ***Krombholziella***, L.Vass.
Stipe cylindrical or spindle-shaped, finelly scaly or rough, cap of dull coloured, Ferous (Fe) reaction gray to greenish.

****Krombholziella aurantiaca*** (Bull.) R.Mre., Edible
Commonly growing under conifers, spruce etc. on soil, Naran, 25.8.98, PMNH 8008.

****Krombholziella scabra***, (Bull.) R. Mre.
Spores 9.75-11.25 x 3.75-4.50 µm. On soil, Lalazar, 28.8.89, PMNH 8065.

Subfamily: **Xerocomoideae**
Cap surface dry or velvety/cracking, pores often broad. Compound, yellow to rust colour, without clamps.

Genus: ***Xerocomus*** Quel.
Pores yellow, regular to becoming gill like.

Xerocomus chrysenteron (Bull.) Quel. Edible
Spores 12-12 x 5-6 µm. On soil under conifer, Malakandi, 25.9.90, PMNH 8393.

****Xerocomus substomentosus*** (L.) ex Fr. Quel.
On soil under conifers, spruce, fir, 28.8.89, PMNH 8644.

Genus: ***Strobilomyces,*** Berk.
Ring present, pores grey, polygonal.

Strobilomyces strobilaceus (Scop.), Fr. Berk.
On ground, Malakandi, Shibata (1992): 154

Genus: ***Chalciporus***, Baitaille
Pore surface of rust colour, reddening cap, dry, smooth, or velvety.

****Chalciporus piperatus*** (Bull.) Bat.
On soil, under conifers and broad-leaved trees; Shogran 26.9.90, PMNH 8392.

Genus: ***Phylloporus*** Quel.
Pores becoming gill-like.

Phylloporus rhodoxanthus (Schw.) Bres.
=*Phylloporus bellus* (Mass.) Corner
On soil, under broad-leaved trees. Sharhan 24.8.89, PMNH 7953.

Subfamily: **Suilloideae**
Cap viscid, pores yellow to ochraceous or olivaceous, stipe sometimes with a ring, granulated surface. Trama diverging (*Boletus*).

Genus: ***Suillus*** Mich. ex S.F.Gray,
Fleshy, pores small/ large various, cap viscid, olivaceous; ring present or absent, membranous; stipe granular or without.

Suillus collinitus (Fr.) Kuntze. Edible
=*Boletus tomentosus* Kauffm.
Cap medium size, fleshy, 10-15 cm dia lumpy, surface darker brown, pores bright yellow medium size. Stipe 8 x 2 cm dotted, bright rosette. Flesh yellow spores 9 x 3 - 4 µm. On grassy ground / under pines, Shogran, 30.8.89, PMNH 8001. Naran, 25.8.89, PMNH 8005 & 8636.

Suillus granulatus (L.):Fr. O.Kunze.
=*Boletus granulatus* L., = *Ixocomus granulatus* Fr. Quel
On the ground, Shogran, Shibata (1992): 154; Murakami (1993): 126.

Suillus placidus (Bonord.) Sing.
It is found under 5-needle conifers (blue-pine), Shogran, 30.8.89, PMNH 8196, 8201; Murakami (1993):126; Iqbal & Khalid (1997).

Suillus sibricus Singer & Singer,
On ground, Sharhan, Ahmad (1969):46; Murakami (1993): 126, 127.

Order 2: **Russullales** (single family)
Flesh granular, brittle, spore print white, creamy, ochraceous or yellow, spores with an amyloid ornamentations, sphaerocysts present.

Family: **Russulaceae,** Roze
Same as above.

Genus: ***Russula*** (Pers.): Fr. S.F.Gray,
No exudation of milky fluid when the flesh is broken. Gills horizontal, rarely at an angle, often forked. Length of stipe is almost equal to cap diameter.

Russula adusta (Pers.: Fr.):Fr.
On the ground, Maklakandi, Shibata (1992): 153.

Russula aurata (With.) Fr.
On the ground, Malakandi, Shibata, (1992):153.

****Russula amara*** Kucera, Edible
Cap violaceous, umbonate, 8-10 cm diam, cuticle, shining, gills medium yellow, stipe 7 x 1 cm white, smell light like bitter fruit taste. Spores 9 x 7 µm, closely warted with an incomplete reticulum, sulfo anillin rection red. Under pine and on acidic soils.
On soil, Shogran (Malakandi) 26.9.90, PMNH 8518.

****Russula amoenicolor*** Romagn.
On soil, Lalazar, 28.8.89, PMNH 8635.

Russula badia Quel.
On soil, Shogran (Malakandi) 26.9.90, PMNH 8526; Iqbal & Khalid (1996).

Russula cyanoxantha (Schaef.) Fr.
On ground, Malakandi, Shibata (1992): 153; Khalid & Iqbal (1995 & 1996).

****Russula corminipes*** Blum.
On soil, Naran, 25.8.89, PMNH 8159.

****Russula consobrina***, (Fr.) Fr.
On soil, Naran, 30.8.89, PMNH 8113.

****Russula decipiens*** (Sing.) K.R ex Svr.
On oil, Shogran, 30.8.89, PMNH 7893.

Russula delica Fr.
On ground, Malakandi, Shibata, (1992):153.

Russula emetica (Schaef.: Fr.) S.F. Gray.
On ground, Malakandi, Shibata, (1992): 153.

****Russula lepida***, (Fr.) Fr.
Under pine vegetation, Naran, 28.8.89, PMNH 8268.

****Russula maculata*** Quel.
Under pine vegetation, Lalazar, 28.8.89, PMNH 8155.

Russula nigricans Fr.
On soil, Lalazar, 28.8.89, PMNH 8204; on ground, Malakandi, Shibata, (1992):154.

****Russula paludosa*** Britz.
Under broad leaved bushes, Shogran, 27.8.89, PMNH 8086.

****Russula parzurea*** J. Schaef.
On soil, Malakandi (Shogran) 26.9.90, PMNH 8530.

****Russula pelargonia*** Niolle.
On soil, Kamalban, 24.9.90, PMNH 8435.

Russula queletii Fr.; Persoon,
On ground in conifer forest. Murakami (1993): 129, Khalid & Iqbal (1995).

****Russula romellii*** R.Mre.
On soil, Lalazar, 28.8.89, PMNH 8656.

Russula rhodopoda Zvara
On ground, under *Abies pindrow*, Sharhan, Iqbal & Khalid (1996).

****Russula torulosa*** Bres.
On soil, Lalazar, 28.8.89, PMNH 8135, Kamalban, 24.9.90, 8490.

****Russula violacea*** Quel.
On soil, Kamalban, 24.9.90, PMNH 8425.

****Russula vinosa*** Lindbl.
Under Juniperous bushes, Babusar, 27.8.89, PMNH 8090.

Russula xerempelina (Sec). Fr.
On ground associated with *Abies pindrow*, Sharhan, Khalid & Iqbal. (1995).

Genus: ***Lactarius*** (Dc.) S.F. Gray,
Flesh yielding milky fluid when broken, gills sloping to somewhat arched or decurrent

Lactarius akahatsu Tanaka
On ground, Shogran, Shibata, (1992):149

****Lactarius atlanticus*** Bon.
On soil, Kamalban, 24.9.90, PMNH 8420 & 8441.

****Lactarius brunneoviolascens*** Bon.
On soil, Shogran, 30.8.89, PMNH 8657.

Lactarius badiosanguineus Kuhn. & Romagon,
On the ground, Shogran, Shibata, (1992):149.

****Lactarius controversus*** (Pers.) Fr. Edible
On soil, Naran 25.8.89, PMNH 8634b.

Lactarius deliciosus (L.) S.F. Gray Edible
On soil, Naran, 25.8.89, PMNH 8221, Kamalban, 24.9.90, PMNH 8450, Shogran, 26.9.90, PMNH 8467 & 8469; Sharhan, Iqbal & Khalid (1996).

Lactarius deterrimus Groger
On soil, Kamalban 24.9.90, PMNH 8449.

Lactarius hatsudake Tanaka,
On ground, Sharhan, Shibata, (1992):149; Murakami, (1993): 28; Iqbal & Khalid, (1996).

Lactarius lacunarum Romagn. ex Hora
On soil, Malakandi Shogran, 26.9.90, PMNH 8541.

****Lactarius obscuratus*** (Lasch.) Fr. Edible
On soil, Shogran, 30.8.89, PMNH 4145.

****Lactarius pergamenus*** (Swartz) Fr. Edible
On soil Lalazar, 28.8.89, PMNH 8264.

Lactarius piperatus (Scop.) S.F. Gray. Edible
On ground, Naran, 25.8.89, PMNH 8160, 8197; Shogran, 26.9.90, PMNH 8297, 8473, 8475, 8506; Iqbal & Khalid (1996).

****Lactarius quietus*** (Fr.) Fr.
On soil, Lalazar, 25.9.90, PMNH 8461, Sharhan, 24.8.89, PMNH 8188.

****Lactarius rugatus*** K.R.
On the ground, Kamalban, 24.9.90, PMNH 8432.

Lactarius romagnesii Bon.
On soil, Kamalban, 24.9.90, PMNH 8426.

****Lactarius sanguifluus*** (Paul.) Fr.
On soil, Naran, 25.8.89, PMNH 8198; on soil, Sari Hut, 26.9.90, PMNH 8540; on soil, on the way to Saiful Maluk 26.9.90, PMNH 8533.

****Lactarius scrobiculatus*** (Scop.:Fr.)Fr.,
On ground, Shogran, Cedrus picea abies forest, Murakami, (1993): 129.

****Lactarius semisangufluus*** Heim. & Lecl. Edible
Naran, 25.8.89, PMNH 8241.

****Lactarius torminosus*** (Sch.) S.F. Gray.
On soil, Kamalban, 24.9.90, PMNH 8416.

Lactarius uridus (Fr.) Fr.
On soil, Lalazar, 25.9.90, PMNH 8405.

Lactarius vellereus (Fr.) Fr. Edible
On soil, Shogran, 26.9.90, PMNH 8476.

Lactarius vietus (Fr.) Fr. Edible
On soil, Kamalban, 24.9.90, PMNH 8443.

Lactarius violescens (Otto) Fr.
On soil, Shorgan, 30.8.89, PMNH 7959, 8277, Lalazar, PMNH 8465, 8466.

Order 3: **Tricholomatales** Bon
Gilled species with fibrous flesh, cap and stem running together, spores white.

Family: **Hygrophoraceae** Roze
Gills distant, thick, with waxy consistency. Basidia elongated, inserted in various ways. Cap surface diverse, dry, scaly to smooth, greasy or very viscid. Stipe smooth viscid, rarely with ring or sheath.

Genus: ***Hygrocybe*** Kummer
Generally vividly coloured mushrooms (Red tomato like). Gills with variable insertion and regular trama.

Hygrocybe bresadolae Quel.
On rotten logs of pine, Sharhan, Iqbal & Khalid (1996).

Hygrocybe conica (Scop. ex Fr.) Kummer
=*Agaricus conica* Scop.
On ground, Sharhan, Ahmad (1980); Murakami (1993): 110; Iqbal & Khalid (1996)

Hygrocybe nigrescens (Quel.) Kuhn.
Cap bright orange to tomato red, gills pale or yellowish 5-6 cm. Stipe fibrillose turning slaty to gray with age. Spores 10-11 x 5-7 µm. On soil, Shogran, Sharhan, 30.8.89, PMNH 8048, 8216.

Hygrocybe alpa (Berk. & Br.) Peglar & Rayner
Spores smooth, 9-12 x 6.75-8.25 µm. On soil, Malakandi (Shogran) 26.9.90, PMNH 8527.

Hygrocybe ovina (Bull.) Kuhn.
On soil, Shogran, 30.8.89, PMNH 8236.

Hygrocybe persistens (Britz.) Sing.
On soil, Kamalban, 24.9.90, PMNH 8423.

Hygrocybe spadicea (Scop.) Karst.
On soil, Sharhan, 24.8.89, PMNH 8112.
Genus: ***Hygrophorus*** Fr.
With adnate or decurrent gills, variously colourd but not bright.Trama bilateral or diverging.

Hygrophorus agathosmus (Fr.) Fr.,
Smell of bitter almond. Murakami, (1993):110.

Family: **Pleurotaceae**
Stipe excentric lateral or absent. Spore print white or pinkish, neither ochraceous nor rust colour

Genus: ***Pleurotus*** (Fr.)
Large fleshy fungi with cylindrical spores.

Pleurotus ostreatus (Jacq.) Kumm. Edible
=*Agaricus ostreatus* Jacq.
Fruit body convex, fleshy with eccentric stipe, bluish grey to sometimes slaty with smooth surface; gills white, unbranched, smell fungoid, spores 11 x 3.5 µm, growing on dead trunks and branches of all kinds. Available late in the rainy season. On tree trunk, Naran, 25-8-89, PMNH 110; on ground, Malakandi, Shogran, Murakami, 1993:110; on trunk of *Juglan regia*, Ahmad (1980): 88.

Pleurotus dryinus (Pers.) Kumm. Edible
On tree trunk, 24.8.89, PMNH 5259, Naran, Malakandi PMNH 8500.

Genus: ***Asterophora*** Ditm. ex Fr.
Only confined on *Russula* fruiting bodies.

Asterophora parasitica (Bull. ex Fr.) Singer
On *Russula* species, Shogran, Ahmad (1980): 76.

Genus **Omphalotus,** Fayod.
Gills deccurent, forked and anastamosing, easily separable from flesh.

Omphalotus olearius (Dc. ex Fr.) Singer
On decaying wood, Sharhan, Ahmad (1980):85; Iqbal & Khalid (1996).

Family: **Tricholomataceae**, Roze
Stipe central, cap fleshy and fibrous.

Tribe: **Clitocybeae**
Gills decurrent to adnate, spores non - amyloid.

Genus: ***Lyophyllum*** Karst

Lyophyllum carbonarium (Vel.) Moser in Gams.
On decaying logs, Sharhan, Iqbal & Khalid (1996).

Lyophyllum decastes (Fr.: Fr.) Sing.
=*Agaricus decastes* Fr.
On ground, Sharhan, Shibata, (1992): 151.

Lyophyllum nigrescens Hongo
On dead wood, Shogran, Murakami, (1993):112.

Genus: ***Paxillus*** Fr.
Gills decurrent anastamosing, crowded. Spores ochraceous

Paxillus panuoides (Fr.) Fr.
On dead trunk of pine tree, Shogran, Ahmad, (1962), Murakami, (1993):124.

Genus: ***Clitocybe*** Kummer
Fleshy fungi with decurrent or downward sloping gills and often funnel shaped cap. Spores smooth, print white, or tinged pink.

Clitocybe brumalis (Fr.) Gill.
Cap small 2-4 cm. umblicate (depressed in the centre), olive grey; gills pale, decurrent. Stipe short, flesh whitish, odorless, under conifers, common during rainy season, arround trees bases, occuring from July to October. On soils, Naran, 25.8.89, PMNH 8270.

Clitocybe dealbata (Fr.) Kummer,
On moist ground, Sharhan, Iqbal & Khalid, (1996).

Clitocybe flaccida Sowerb.
On ground, Sharhan, Iqbal & Khalid, (1996).

****Clitocybe fragrans*** (With.) Kumm.
Cap small 2-4 cm, umblicate, margin striate, smell like pure aniseed. Common under conifers, Kamal -ban, 24.9.90, PMNH 8427.

Clitocybe gibba (Fries.) Kummer,
Spores in-amyloid and pyriform. On ground in *Pinus wallichiana* forest, Balakot, (1993):110.

****Clitocybe infundibuliformis*** (Schaeff ex Fr.) Quel.
On dead pines wood, Shogran, 30.8.89, PMNH 8296.

****Clitocybe mortuosa*** (Fr.) Gill
On soil, 24.9.90, Kamalban, PMNH 8429, 8431.

****Clitocybe nebularis*** (Batch) Kumm.
On soil, Malakandi 27.9.90, PMNH 8524

****Clitocybe squamulosa*** (Pers.) Kumm.
On wood, Malakandi, 10.7.89, PMNH 8049.

Genus: ***Armillaria*** (Fr. ex Fr.) Staude.
Gills adnate or slightly decurrent. Cap scaly. Stipe with or without ring, around or on the trees in clusters.

Armillaria tabescens (Scop.) Emel.
Cap comparatively small and closely packed and soon depressed with brownish streaks, dotted with brown warts towards the center. Stipe selender, without ring. It is found in dense tufts. On pine wood, Lalazar 28.8.89, PMNH 8209. Kamalban PMNH 8508.

Genus: ***Armillariella*** (Karst.) Karst.,
On tree, in bunch with prominent broad ring.

Armillariella mellea (Vahl.) Kumm.
=*Agaricus melleus* Vahl. ex Fr.
Cap 4-7 cm, umbonate, at the centre with small yellowish brown scales, margin incurved, gillls arched or decurrent. Stipe in clustred 12 x 1 cm. Rhizomorph balckish brown. Spores 8 µm long elliptical. Clamps absent.
On stumps or arround trees. Soil, Lalazar, 25.9.90, PMNH 8409; Shogran, Malakandi, Shibata, (1992):146; Murakami, (1993): 110; Iqbal & Khalid (1996).

Genus: ***Hypsizigus*** Sing.
Growing alone or in pairs (sometimes in clusters of three). Cap: convex with a slightly inrolled margin at first, becoming almost flat.

Hypzigus marmoreus (Peck.) Bigelow,
On ground, Shogran, Murakami, 1993: 110-111

Genus: ***Lepista*** (Fr.) W.G. Smist,
Gills readily separable from the flesh. Spores white or pale, pink in mass, minutely warted.

Lepista sordida (Schum.: Fr.) Sing.,
On ground, Shogran, Murakami, (1993): 150.

****Lepista inversa*** (Scop.) Pat. Edible
Cap 5-9 cm becoming umblicate with incurved margin. Surface smooth, bright tawny to reddish brown or rusty orange. Gills deeply decurrent, ochraceous russet. Stipe 4-6 cm, smooth, similar colour, smells fungoid. Usually found under conifers. On soil, Kaghan, 11.7.89, PMNH 8311.

****Lepista nuda*** (Bull.) Cke. Edible
Under conifers, common through out the rainy season. Malakandi, 27.9.90, PMNH 8414.

****Lepista obscura*** (Sch.) Herink
On soil, Shogran, 26.9.90, PMNH 8529.

Genus: ***Repartite*** Huijsm.
Gills sloping, pinkish ochre, spores with prominent truncate spine and pink in mass.

****Repartite metrodii*** Huijsm.
On soil, under conifers and broad leaved trees, Kamalban, 24.9.90, PMNH 8444.

Genus***: Laccaria*** Berk. & Br.
Gills horizontal with decurrent teeth, spores usually spiny.

Laccaria amethystea (Bull.) Murr. Edible
Cap medium, convex, then flat, margin wavy, bright and faded away with age, gills irregular; bright violet. Stipe long 6-8 cm. Spores sub-globose 7.5-8.25 x 4.5 um. Common during rainy season under the pine vegetation, edible. On soil, among grass, under conifers and walnut trees Malakandi, 26.9.90, PMNH 8532, Shogran, 30.8.89, PMNH 8234, 8253, Naran PMNH 8156.

****Laccaria bicolor*** (R. Mre.) Orton.
On soil, Shogran, 26.9.90, PMNH 8513.

Laccaria laccata (Scop.) Berk. & Br.
On soil, Kamalban, 24.9.90, PMNH 8446, 8421, Burawai 28.8.89, PMNH 8186. Lulusar Lake 27.8.89, PMNH 8174; Sharhan; Shibata (1992): 148-149.

****Laccaria laccata*** var. ***moelleri*** (L.) Proxima.
Malakandi, 10.8.89, PMNH 7886a.

****Laccaria tortilis*** (Bolt.) Cke.
On soil Naran, 9.7.89, PMNH 8102.

Tribe: **Tricholomatcae**
Gills horizontal, spores smooth, non amyloid, cystidia on the edge, visible under handlens. Numerous clamp connection present.

Genus: ***Tricholomopsis***, Sing.
Gills fringed with large cystidia.

Tricholomopsis rutilans (Sch.) Sing.
On dead trunk of Pinus, Shogran & Malakandi, Murakami, (1993):114.On stumps of conifers, Shogran 26.9.90, PMNH 8474, 8400.

****Tricholomopsis sulphurescens*** Bres.
On soil, usually growing under oak and conifers. Kamalban, 24.9.90, PMNH 8448, 8454.

Tricholomopsis inamoenum (Fr.) Gill.
Usually found under spruce at high altitude, on soil Kamalban, 24.9.90, PMNH 8397.

Tricholomopsis nitellina (Fr. Sing.
On soil, under conifers, Kamalban, 24.9.90, PMNH 8428.

Tricholomopsis vaccinum (Sch.) Kumm.
On soil, under *Cedrus deodara,* 25.8.89, PMNH 8074.

Genus: ***Tricholoma*** (Fr. ex Fr.) Kumm.
Cap and stipe concolour with ring, orange colour.

Tricholoma aurantinum (Schaeff.:Fr.) Ricken,
On soil, Shogran, Shibat (1992): 155; Murakami (1993): 114.

Tricholoma terreum (Schaef.:Fr.) Kummer,
=*Agaricus terreus* Schaef.
On ground, Shogran and Malakandi, Shibata, (1992): 155.

Tribe: **Leucopaxilleae**
Spores amyloid.

Genus: ***Leucopaxillus***, Boursier
Gills slightly decurrent (like *Clitocybe*) and easily separable from the flesh of cap.

Leucopaxillus gentianeus (Quel.) Kotl.
On ground, Shogran, Murakami, (1993): 111.

Leucopaxillus giganteus (Leyss.) Sing. Edible
Fruiting body large, 20-40 cm, funnel shaped, margin wavy; gills decurrent; stipe short, spores smooth, flesh white to creamy, slightly aromatic, spores smooth, 6-7.5 x 4.5 µm with oil globules, growing among grass, lawns and wood, usually forming ring. On soils, under conifers, Malakandi, 26.9.90, PMNH 8471.

Leucopaxillus paradoxus (Cost. & Duf.) Boursier
On soil, under walnut & conifer trees, Naran, 25.8.89, PMNH 8196.

Genus***: Paxillus*** Fr.
Gills decurrent, soft, seprable from the cap; ochre.

Paxillus panuoides (Fr.) Fr.
On soil, Shogran, Murakami, (1993):124.

Genus: ***Oudemansiella***, Speg.
Fruit body fleshy, with elongated shape, some with ring; cap-surface viscid, spores non amyloid.

Oudemansiella platyphylla (Pers.:Fr.) Moser.
On ground, Sharhan, Shibata.(1992): 151.

Oudemansiella radicata (Relh.) Sing.
Fruiting body fleshy with a long stipe; cap convex 8-10 cm, viscid, white with greyish tinge. Stipe about 6 cm long. Spors 16 x 13 µm.
On standing trunks / fallen branches, Kamalban, 24.9.90, PMNH 8457; Iqbal & Khalid, (1996).

Oudemansiella longipes (Kumm.) Moser.
On soil and on tree trunk, under coniferous vegetation, Kamalban, 24.9.90, PMNH8451.

Family: **Marasmiaceae**
Flesh thin, leathery, cartilaginous, shrivilling without rotting.

Genus: ***Baeospora*** Singer,
Same as above but with dermatocystidia and growing on decaying cones of conifers.

Baeospora myosura (Fr.) Sing.
On cone of *Pinus excelsa*, Kaghan, Sharhan, Ahmad (1968): 43; (1980): 76.

Genus: ***Marasmius***, Fr.
Delicate, withering, cuticle wrinkled, become dry without rotting.

Marasmius alliaceus (Jacquin) Fr.
Fruit body creamy, ochraceous, umbonate, surface whitish; gills distant. Spores 7.5x 5.5 µm pale hyaline. Under broad leaved bushes, Sari Hut, 26.9.90, PMNH 8537.

Marasmius androsaceus (L.) Fr.
On pine needles, Kamalban, 24.9.90, PMNH 8488.

Marasmius scorodonius (Fr.) Fr.
On wood, Sharhan, 24.8.89, PMNH 8063; Kamalban, 24.9.90, PMNH 8399.

Genus: ***Cirinipellis***, Pat.
Delicate, small, pileus surface covered with concentric hairs.

Crinipellis stipitarius(Fr.) Pat.
On soil, among pine needles and grass, Kamalban, 24.9.90, PMNH 8411.

Genus: ***Strobilurus***, Sing.
Pileus and stipe of brown colour, gills distant.

Strobilurus esculentus (Wulf.) Sing. Edible
Fruit body small, usually on fallen leaves, branches & cones etc. Cap 2-3 cm dia, convex, light brown. Growing among logs; Naran, 9.9.89, PMNH 8109, Kamalban 24.9.90, PMNH 8492.

Genus: ***Marasmiellus***, Murrill
Small tough fungi, on woody substrates, with dry, downy caps, cuticle with lobed & inter locking hyphae.

Marasmiellus ramealis (Bull.) Sing.
Fruit body small, cap hemispherical to flattened, light brown, cap & stipe of same colour, flesh tough. Cystidia and cuticular hairs some what lobed. spores 8 x 4 µm. Usually occur on fallen leaves under broad leaved trees and bushes, Sharhan, 24.8.89, PMNH 8188.

Genus: ***Megacollybia***, Pers.
It is very similar to *Collybia* & *Tricholoma* but bigger in size.

Megacollybia platyphylla Pers. Edible
Cap is hemispherical to flattened, grayish, surface radiately streaky, fibrillose and sometimes cracking, darker and depressed in the center; 6–8(15) gills broad. Stipe smooth of same colour or lighter; spores ovoid, non- amyloid. On humus of pine needles, under conifer forest, Shogran, 26.9.90, PMNH 8638.

Genus: ***Collybia***, Kumm.

Surface of the pileus is glaced, or elastic, smooth, cuticular hyphae filamentous, or with lobed cells.

Collybia confluens (Pers.) Kumm.
=*Marasmius confluens* (Pers. ex Fr.) Karst.

Fruiting body small, being flesh to light brownish, stipe selender; cap 3-4 cm; gills whitish to pink, crowded; spores 5-7 x 4 µm. Growing among grass, Bella, 8.7.89, PMNH 8163. Sharhan, Ahmad (1969): 44.

****Collybia distorta*** (Fr.) Quel.

On soil, Kamalban, 10.7.89, PMNH 8105.

Collybia dryophyila (Bull.) Kumm.
=*Agaricus dryophilus* Bull.

On soil Sharhan, 24.8.89, Shogran, 8129, Naran, 25.8.89, PMNH 8194; Shibata, (1992):147, Iqbal & Khalid, (1996).

****Collybia fusipes*** (Bull.) Quel.

Fruit body orange brown, cap 4-10 cm; gills pale, margin wavy; stipe 5-10 cm of same colour. Spores 5 x 4 µm. On soil, Malakandi, 8.5.90, PMNH 7884.

****Collybia kuehneriana*** Sing.

On soil, Kamalban, 24.9.90, PMNH 8442.

Collybia maculata (As.) Kumm.

Growing among stones, under broad leaved bushes (*Sambucus* sp.). Burawai 28.8.89, PMNH 8136; Sharhan, Iqbal & Khalid, (1996).

Collybia peronata (Bolt.) Kumm. Around trees, Malakandi 8.5.90, PMNH7870.

Genus: ***Mycena,*** (Pers.: Fr.) S. F. Gray

Stipe to some exten selender, with cap often hemispherical, and striate margin.

Mycena vulgaris (Pers.) Kumm.

Cap convex 1-1.5cm, grayish, gelatinous; gills arched to decurrent. Stipe 3-5 cm viscid, smell faint. Spore 7-10 x 4 µm. Cystidia clavate, brush like. Commonly found in beds of needles of conifers. On fallen logs / needles, Malakandi 8.5.90, PMNH 7863.

Mycena haematopus (Pers.: Fr.) Kummer,

On wood logs, Malakandi, Shibata, (1992): 151.

****Mycena inclinata*** (Fr.) Quel.

On branches, Bella, 8.7.89, PMNH 8098, 8104, 8106.

Mycena leptocephala (Pers.) Gill.

On soil / needles, Sharhan, 24.8.89, PMNH 8152.

Mycena pura (Pers.: Fr.) Kummer,
=*Agaricus pura* Pers.,

On ground, Malakandi, Shibata, (1992): 151.

****Mycena speirea*** (Fr.) Gill.

On soil / debris, Kamalban, 24.9.90, PMNH 8484.

Order 4: **Pluteales**

Spores and gills pink or reddish to brick colour.

Family: **Entolomataceae**
=(Rhodophyllaceae)

Cap well-developed, gills adnate, decurrent, or almost free. Spores polyhedral or longitudinally angled.

Genus: ***Resupinatus***, Nees ex S.F.Gray

Small, sessile, flesh gelatinous, cystidia not thick walled.

Resupinatus applanatus (Batsch ex Fr.) S.F. Gray

On wood, Shogran, Ahmad, 1980: 88.

Genus: ***Clitopilus,*** (Fr.) Kumm.

Gills decurrent; spores longitudinally angled.

Clitopilus creatus (Berk. & Br.) Sacc.

Fruit body funnel-shaped but asymmetrical; gills pink, decurrent; stipe short. On ground 26.9.90, PMNH 8514.

Genus: ***Rhodocybe,*** Maire

Fleshy fungi with adnate & decurrent gills; spores warted.

****Rhodocybe popinalis*** (Fr.) Sing. Edible

Cap fleshy, umbonate, margin wavy, greyish brown 4–6 (7) cm; gills sloping; stipe variable 3-8 cm, smell aromatic to mealy; found in all type of forests, in lawn. On soil, Shogran, 30.8.89, PMNH 8276.

Rhodocybe subgilva (Berk. & Br.) Pegler,

On ground Balakot; Ahmad, (1980): 63.

****Rhodocybe truncatus*** (Gill.) Sing. Edible

On soil, Naran, PMNH 8010.

Genus: ***Entoloma*** (Fr.) Kumm.

Fruit body funnel shaped. Spores polyhedral.

****Entoloma cetratum*** (Fr.) Moser.

Cap 2-5 cm at first conical and expanding later on, central area like the pupil of an eye, yellowish brown, paler toward margin. Gills free; stipe stout; spores 13 x 8 µm with wavy margin. On wood, Kamalban, 10.7.89, PMNH 8013.

****Entoloma mougeotii*** (Fr.) Hesl.

On soil, Naran, 9.7.89, PMNH 8101.

****Entoloma papillatum*** (Bres.) Dennis

On soil, Shogran, 30.8.89, PMNH 8282.

Genus: ***Volvariella***, Speg.

Membranous cup shaped volva, resembling to *Pluteus*.

Volvariella speciosa (Fr.) Sing. Edible (Chinese mushroom)
=*Agaricus speciosus* Fr.

Cap off-white, glistening, 6-12 cm, viscid; stipe about 10 cm or long, volva present at the base; spores, 10-16 um. Usually found on rotting straw / manured ground. Commonly found during rainy season, under all kinds of wood lands, among grass, Shogran, 30.8.89, PMNH 8251.

Order 5: **Cortinariales**

Spores and gills rusty or brownish to blackish at maturity; cap not easily separable from the stipe.

Family: **Cortinariaceae**

Spore print and gills rusty, not blackish, gills adnate or sinaute.

Genus: ***Cortinarius*** Fr.

Cap surface silky, velvety, light or dark color. Cortina net below the cap distinctive. Cystidia present.

Cortinarius bulliardi (Fr.) Fr.

On ground, Shogan, Murakami, (1993): 121.

****Cortinarius claricolores*** (Fr.) Fr.

Cap fleshy, pale yellow; veil discontinous; gills white or pale, flesh pale with slight smell; spores 9 x 3 µm. Usually found under spruce, & decidous trees. Edibility not confirmed. On soil, Naran, 25.8.89, PMNH 8095.

****Cortinarius delibutus*** Fr.

On soil, Lalazar, 25.9.90, PMNH 8463.

****Cortinarius elegantissimus*** Hry.

Cap 5–10(12), striking yellow , centrally orange, gills bright yellow; stipe 8–10(12), concoloure lighter, bearing slightly narrowing bulb at the base 3-4cm. Smell pleasant; KOH reaction Carmine red on cap. Spores 13–15 x 7–8 µm, strongly rough. On usually growing on chalky soil, Lalazar, 28.8.89, PMNH 8200, 8202.

****Cortinarius gentilis*** (Fr.) Fr.

On soil, Sari – Hut (Shogran) 26.9.90, PMNH 8544.

****Cortinarius infectus*** (Pers.) Fr.

On soil, under conifer trees, especially spruce, Shogran, 30.8.89, PMNH 8133.

****Cortinarius melanotus*** Kalehbr.

On soil, Shogran, 30.8.89, PMNH 886, Lalazar, 25.9.90, PMNH 8459.

****Cortinarius percomis*** Fr.

Cap pale yellow; gills bright; spores 6 7.50 x 4.5 6 µm. On soil, Malakandi, 26.9.90, PMNH8517.

****Cortinarius schaefferi*** Bres.

On soil, under conifer trees, Shogran, 30.8.89, PMNH 8205.

****Cortinarius rufoolivaceus*** (Pers.) Fr.

Cap 8–12 cm, purplish colour; gills olive colour; stipe long, bulbus at the base; smell faint; KOH reaction dark green. Spores 9 x 5 µm. On soil, under walnut trees / conifers, Naran, 25.8.89, PMNH 8267.

****Cortinarius subturbinatus*** Hry. ex Orton

On soil, under conifer vegetation, Malakandi 27.9.90, PMNH 8407.

****Cortinarius sanguineus*** (Wulf.) Fr

On soil, under spruce and fir, Lalazar, 25.9.90, PMNH 8401.

Cortinarius violaceus (L) Fr.

On humus soil, under spruce, fir, Naran, 28.8.89, PMNH 8153, Balakot, 23.8.89, PMNH 8260.

Genus: ***Hebeloma*** Kumm.

Cap viscid, dull brownish to whitish, pinkish brown, gills coffee color, spores rough.

****Hebeloma anthracophilum*** R. Mre.

On the ground, under conifer trees; spores 11.2 x 7.50 µm. Naran, 9.7.89, PMNH 8304.

****Hebeloma sinapizans*** (Paul.) Gill.

On the ground, under broad leaved trees, Shogran, 30.8.89, PMNH 8114.

****Hebeloma truncatum*** (Schaeff. ex Fr.) Quel.

On soil, under conifer & broad leaved trees, 25.8.89, PMNH 8193.

Genus ***Naucoria*** (Fr.) Kummer,

Fruiting body somewhat slender, light in colour.

****Naucoria bohemica*** Vel.

On soil under Juniperous bushes, Babusar top, 27.8.89, PMNH 8262.

Genus: ***Inocybe*** (Fr.) Fr.

Fruiting bodies mostly small. Cap often conical, surface fibrillose to scaly or silky, often splitting radially; gills beige to tobacco brown, mostly toxic species containing muscarin.

****Inocybe adaequata*** (Britz.) Sacc.

On humus of Pine needles, Lalazar, 28.8.89, PMNH 8038.

Inocybe asterospora Quel.

On soil, Naran, 25.8.89, PMNH 8030; Shibata (1992): 148.

****Inocybe fibrosa*** (Sow.) Gill.

On soil, Naran, 10.7.89, PMNH 8168.

Inocybe fastigiata Bull.

On humus, Shogran, 30.8.89, PMNH 8127, 8130, Naran 26.9.90, PMNH 8626, 9.7.89, Ahmad (1962): 127, Shibata, (1992): 148.

****Inocybe fuscidula*** Vel.

On humus, Naran, 25.8.89, no 8245.

****Inocybe geophylla*** (Bull.) Karst.

On humus, Naran, 9.7.89, PMNH 8039.

****Inocybe glabripes*** Ricken.

On soil, Naran, 25.8.89, PMNH 8242.

****Inocybe hirtella*** Bres.

On soil, Shahran, 24.8.89, PMNH 8031.

****Inocybe napipes*** Lange.

On soil, Sharhan, 24.8.89, PMNH 8249; Kamalban, 24.9.90, PMNH 8422.

Inocybe patouillardii Bres.

On soil, Malakandi (Shogran), 26.9.90; PMNH 8531; Sharhan, Iqbal & Khalid, (1996).

****Inocybe praetervisa*** Quel.

On soil, Lalazar, 27.9.90, PMNH 8396.

Inocybe pyriodora (Pers.: Fr.) Quel.

On ground, Shogran, Murakami, (1993): 122.

****Inocybe vaccina*** Kuhn.

On soil, upper Bella, 24.8.89, PMNH 8036; on Humus, Lalazar, 25.9.90, PMNH 8460.

Family: **Crepidotaceae**

Spores and gills ochraceous to rust; gills decurrent to somewhat sinuate. Chrysocystidia absent. Spores smooth or warty, without germ pore. Hyphae of the cap filamentous or jointed.

Genus: ***Gymnopilus*** Karst

Resembling *Tophaliota* but rust coloured with small size of scales on the cap. Saprophytic on wood.

Gymnopilus hybridus (Fr.:Fr.) Sing.,

On dead trunk of Pinus, Shogran, Murakami, (1993): 121.

Family: **Strophariaceae**

Spores & gills violaceous.

Genus ***Stropharia*** (Fr.) Quel.

Stipe with a ring or bracelet. Cap lacking cellular hypodermis.

Stropharia aeruginosa (Curt.: Fr.) Quel.

=*Agaricus aeruginosus* Curt.

On ground, under *Betula,* Malakandi, Shibata (1992): 154.

Stropharia semiglebusta (Batch.) Quel.

On soil, Naran, 9.7.89, PMNH 8107; Sharhan, Iqbal & Khalid, (1995).

Genus: ***Hypholoma*** (Fr.) Kumm.

Stipe with cortina, with or without cellular hypodermis.

****Hypholoma elongatum*** (Pers.) Ricken

On stumps and humus of conifer needles, Naran, 25.8.89, PMNH 8246.

****Hypholoma subviride*** (BerK. & Curt.) Dennis.

On wood, Malakandi, 27.9.90, PMNH 7872, Bella, PMNH 7883, Kawai, PMNH 8167, Sharhan, PMNH 5259.

Genus: ***Psilocybe*** (Fr.) Kummer,

Neither ring nor cortina and volva present.

****Psilocybe merdaria*** (Fr.) Ricken.

=*Agaricus medinus* Fr.

Cap 2-4cm, olivaceous ochre, fading with age; spores 10-13.4 x 5.6 µm. It is usually found on dung and on manured soil, during rainy season, cosmopolitan. On dung, Malakandi 24.9.90, PMNH 8438.

****Psilocybe semilanceata*** (Fr.) Kumm.

Spores 12-15 x 7-8 µm. On soil, Shogran, 30.8.89, PMNH 8044, Naran, 28.8.89, PMNH 8291 and Sharhan, 24.8.89.

Genus: ***Pholiota*** (Fr.) Kumm.

Spores and gills rust color; cap & stipe yellow, somewhat scaly or viscid.

Pholiota luburica (Pers.: Fr.) Sing.

On ground, Malakandi, Shibata. (1992): 152.

****Pholiota tuberculosa*** (Sch.) Kummer,

On soil and wood, Lalazar, 28.8.89, PMNH 8265.

Family**: Bolbitiaceae**

Cap surface matted, wrinkled, covered with bright particles.

Genus: ***Agrocybe*** Fayod

Spores and gills dull brown or tobacco color, cap fleshy.

****Agrocybe arvalis*** (Fr.) Sing.

On soil, Sharhan, 24.8.89, PMNH 8250.

****Agrocybe vervacti*** (Fr.) Sing.

On soil, Naran, 25.8.89, PMNH 8059.

Genus: ***Panaeolus*** (Fr.) Quel.

Spores and gills dark brown to blackish, gills generally mottled.

Panaeolus fimicola (Pers.) Quel.

On animal manured soil / blackish humus of pine needles and dung, Lalazar, 25.9.90, PMNH 8499.

****Panaeolus rickenii*** Hora

It has obtuse cap, powdered stipe. Common in grassy ground.

Panaeolus acuminatus Sensu Ricken non Sensu Fr.

On dung, Naran, 9.7.89, PMNH 8021 among grass; Sharhan, Ahmad, (1980):55.

Order 6: **Agaricales**

Stipe separable from cap; spores and gills white or blackish.

Family: **Coprinaceae**

Spores and gills dark, violaceous brownish to blackish; gills not mottled, somewhat fragile or deliquescent.

Genus: ***Psathyrella*** (Fr.) Quel.

Cap flat or campanulate, non-deliquescent, not or slightly striate.

Psathyrella artimisea (Pass.) K.M.

On soil, Shogran, 30.8.98, PMNH 8116.

Psathyrella atomata (Fr.) Quel.

Arround trees, Shogran, 30.8.89, PMNH 8255.

****Psathyrella ammophila*** (Dur & Lev.) Orton.

On soil, Sharhan, 24.8.89, PMNH 8025.

****Psathyrella bipellis*** (Quel.) A.H. Smith

On soil Sharhan, 24.8.89, PMNH 8027.

Psathyrella candoleana (Fr.) R. Mre.

Under Juniper bushes, Babusar slop (Chilas), 27.8.89, PMNH 8075.

****Psathyella conopilus*** (Fr.) Pear & Dennis

On soil, Kamalban, 10.7.89, PMNH 8027, Malakandi, Shogran 26.9.90, PMNH 8543.

Psathyrella gracilis (Fr.) Quel.

On soil, Naran, 25.8.89, PMNH 8080 & 8244; Babusar (Chilas), 28.8.89, PMNH 8543; Sharhan, Iqbal & Khalid, (1996).

****Psathyrella hirta*** Peck.

On soil, Shogran, 30. 8. 89, PMNH 8026, Naran, 9.7.89, PMNH 8032.

Psathyrella spadiceo- grisea (Fr.) Maire.
On the ground under *Abies pindrow*, Sharhan, Iqbal & Khalid (1996).

Genus: ***Coprinus*** Pers.
Cap ovoid to conical, thin deliquescent at maturity; stipe hollow, easily separable from the cap, spores light brown to dark.

Coprinus atramentarius (Bull.) Fr.
On soil, Shogran, 26. 9. 90, PMNH 8413.

Coprinus comatus (Muell. ex Fr.) S. F. Gray,
On soil, Shogran, Ahmad, (1956): 77; Shibata, (1992):142; Murakami, (1993): 119, Iqbal & Khalid (1996).

****Coprinus lagopus*** (Fr.) Fr.
On soil, Shogran, 30.8.89. PMNH 8301.

****Coprinus patuillardii*** (Quel.) Pat.
On soil, Malakandi, 27.9.90. PMNH 8545; Shogran, 30.8.89, PMNH 8294.

****Coprinus setulosus*** Berk. & Br.
On soil, Lalazar, 25.9.90. PMNH 8483.

Family: **Agaricaceae**
Gills free; spore print white or blackish, occasionally greenish or reddish, partial veil or ring or sheath present.

Genus: ***Agaricus*** L. ex Fr.
Ring complex, shaggy or double by a basal sheath, sometimes like an appressed volva; flesh reddening.

Agaricus bisporus (Lange.) Imbach Edible
Cap usually 5-10 cm, convex, whitish then russet-brown; gills pink then bistre. Stipe 5 x 1 cm, whitish, ring smaller, flesh turning slightly pink, smell & taste pleasant. Successively cultivated on commercial scale. Usually found during rainy season throughout the country. On humus soils near graveyard, Balakot, 23.8.89, PMNH 8269.

Agaricus silvaticus Sch. Edible & Good
It is similar to *A. bisporus*, slightly smaller, gills pinkish to grayish brown , ring fragile, smell pleasant. It is commonly found under the coniferous forest. On soil, Malakandi, 26.9.90, PMNH 5645.

Agaricus trisulphuratus Berk.
=*Cystoagaricus trisulphuratus* (Berk.) Singer
On soil, Shogran, 30.8.90, PMNH 5643.

Agaricus placomyces Peck.
=*Psalliota meleagris* Schaeff.
On ground, Malakandi, Shibata (1992): 146.

Genus: ***Lepiota*** (Pers.) S.F. Gray
Small to medium size cap with central patch, commonly surrounded by scales in concentric way; stipe ringed; gills broadest at the middle, typically free, marginal flaps often present; poisonous.

Lepiota alba (Bres.) Sacc.
Cap 3-5 cm, umbonate, disc ill-defined or obtuse, ochraceous fleecy, fibrillose or velvety margin; gills well spaced, milky white. Stipe often spindle shaped. Spores 1-4 x 6.5 µm, variously shaped.
Under broad leaved trees, Lawn, sandy soils, Sari- Hut, 26.9.90, PMNH 8470, Borawai, 28.8.89, PMNH 7954.

Lepiota anthomyces (Berk. & Br.) Sacc.
Balakot, Ahmad (1980): 67. Iqbal & Khalid (1996).

Lepiota aspera (Pers.: Fr.) Quel.
On ground, Sharhan, Murakami, (1992): 118.

****Lepiota badhamii*** Berk.
On soil, Shogran, 30.8.89, PMNH 8176.

Lepiota cristata (Abb. et Schw. ex Fr.) Kummer,
On ground, Sharhan, Iqbal & Khalid, (1996).

****Lepiota ignivolvata*** Joss.
On soil and around trees (conifers) Sharhan, 28.8.89, PMNH 7952.

****Lepiota ochraceofulva*** Orton
On soil, Malakandi, 24.9.90, PMNH 8458.

Lepiota racodes(Vitt.) Quel.
On ground, Sharhan, Iqbal & Khalid (1996).

****Lepiota ventriospora*** Reid. var. ***fulva***
On soil, Naran, 25.8.89, PMNH 8222.

Genus: ***Phaeolepiota*** Mairre ex Konrm. & Maubl.
Fruiting bodies large, of thick flesh usually orange in colour, ring on the stipe is funnel shaped.

Phaeolepiota aurea (Matt.: Fr.) Maire.
On ground, Shogran, Murakami (1993):119; Shibata, (1992): 152. Iqbal & Khalid (1996).

Genus: ***Leucoagaricus*** (Locq.) Sing.
Cap surface covered with scales, clamp connections absent, ring present on the stipe, spores white.

****Leucoagaricus serenus*** (Fr.) Bon. & Boiff.
On soil, Shogran, 30.8.89, PMNH 7955.

Genus: ***Macrolepiota*** Sing.
Fruiting bodies fleshy with large cap, surface distinctly peeling back or with striking scales, ring moveable on the stipe.

****Macrolepiota venenata*** Bon.
On soil, Shogran, 30.8.89, PMNH 7953.

Genus : ***Stropharia*** (Fr.) Quel.
Stipe with ring or bracelet, spores and gills violaceous, spores smooth, often with distinct germ pore.

Stropharia aeruginosa (Curt.: Fr.) Quel.,
On ground, Malakandi, Shibata (1992:154.

Family: **Amanitaceae**
Generally veil taking the form of basal volva or evanescent patches on the upper surface of cap, gills free.
Genus: ***Amanita*** Pers. ex Hooker
Universal veil membranous, pulverulent or with variable patches; poisonous but medicinal. Several species are deadly poisonous.

***Amanita batterae** (Bound.) Bon.
On soil, Lalazar, 25.9.90, PMNH 8415, 8481, Shogran, 26.9.90, PMNH 8477.

Amanita ceciliae (Bk. & Br.) Berk.
On soil, Shogran, 30.8.89, PMNH 8115, Murakami, (1993): 114.

Amanita flavipes Imai,
Shogran, Murakami, (1993): 114-115.

Amanita pantherina (Dc.) Krombh.
On soil, Shogran, 30.8.89, PMNH 8235; Shibata, (1992): 146.

Amanita rubenscens Pers.: Fr.
On ground, Shogran, Murakami, (1993): 116.

Genus: **Termitomyces** Heim.
Growing on Termites dunes during late rainy season.

Termitomyces microcarpus (Berk. & Br.) Heim.
On soil, Malakandi, 26.9.90, PMNH 8519, Naran, 8307, 5635.

Termitomyces rabourii Otieno;
On soil, Shogran, 30.8. 89 PMNH 8281.

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